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METEOROLOGICAL DEPARTMENT

INDIA WEATHER REVIEW, 1947

ANNUAL SUMMARY

PART B SNOWFALL

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Atmospheric Administration
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UNDER THE DIRECTION OF WEATHER BUREAU

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Director General of Observatories

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Atmospheric Administration
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INDIA WEATHER REVIEW, 1947.

ANNUAL SUMMARY.

PART B.

SNOWFALL.

This part contains a summary of the reports of snowfall in the mountain regions to the north of India. These reports are collected by local officers from the local residents, headmen of villages, or from travellers who have passed through the region, and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with raingauges the snow collected in the gauge is melted and measured as rain; this is indicated in the text and the amounts are given in inches and cents.

Cold Weather Period -- January & February

I.—KASHMIR.

Skardu.—At the station proper, snow fell on four days in each of the months January and February. The accumulations of snow were 3 in. at the end of January and nil at the end of February. On the surrounding mountains the accumulations were about 5 ft. at the end of January and 4 ft. at the end of February. The falls and accumulations were about normal.

Dras.—Snowfall during the season at Dras and neighbourhood was reported to be abnormally heavy. At the end of January the depth of snow was 9 ft. at Dras proper and 10 ft. on the Zojilla Pass. In February, snow fell to a depth of 3 ft. at Dras, 4 ft. on the surrounding mountains and 4½ ft. on the Zojilla Pass. The accumulations at the end of the season were 12½ ft. at Dras proper and 16 ft. on the Zojilla Pass.

Srinagar.—Eight light to moderate falls of snow were observed both on the surrounding Pir Panjal mountain range as well as in the valley during the first three weeks of January. The total snowfall of the month at the Central Observatory, Srinagar, when melted and measured as rain amounted to 53 cents. The snow accumulations on the Pir Panjal range were reported to be considerably above normal.

In February four light to moderate falls of snow were observed on the Pir Panjal range. Light falls of snow occurred in the Srinagar valley also. The snow associated with the heaviest fall when melted amounted to 21 cents. The accumulations at the end of the season on the surrounding mountain ranges were considerably above normal.

Kargil.—Snow fell on four days in January and on one day in February. The accumulations of snow at the end of each of the two months were about 6 ft. on the high peaks and one foot to half a foot on the ground.

Sonamarg.—Snow fell on two days in January and on five days in February. The accumulations of snow on the ground were about nine feet at the end of January and eight feet at the end of February, and on the Zojilla and Nichaney passes 11 ft. at the end of January, and 10 ft. at the end of February. These were above the average.

Leh.—No report was received.

II.—THE EAST PUNJAB.

Chamba.—Kalatop Range—Snow fell on four days in January and on three days in February to total depths of 5 ft. 5 in. and 3 ft. 1 in. respectively. At Kalatop, the accumulations were about 4 ft. to 5 ft. at the end of January and 8 ft. in shady places at the end of February. Dalhousie was almost clear of snow by the end of the period. The falls were above normal in both the months above 7,000 ft.

Pangi Range.—At Kilar (8,400 ft.) snow fell on 8 days in January to a total depth of 5 ft. 8 in. and on 5 days in February to a total depth of 2 ft. Accumulations of snow at the end of January were 3 ft. 8 in. The accumulations at the end of February could not be estimated as all the high and well known passes were under heavy snow. The falls were nearly normal in both the months.

Bhawal Range.—There were six falls of snow in January and four in February at Bhawal proper (6,000 ft.). In February, there were two more falls of snow on the high peaks (9,000 ft. and above). The total depth of the falls was about 3 ft. in January and 5 in. in February. The accumulations at the end of the season were nil at Bhawal proper and about 3 ft. at a height of 9,000 ft. The falls were normal in January and below normal in February.

Kangra District.—Snow fell to depths of about 6 ft. and 1½ ft. respectively in January and February on the high ranges of the Himalayas in the Kangra and Palampur Tehsils and in the Kulu sub-division. The falls during both the months were below normal. The accumulations on the high ranges were about 10 ft. at the end of January and 7 ft. at the end of February, and these on the higher passes 3 to 6 ft. and 3 to 11 ft. respectively.

Kilba Hills (Simla District).—There were 8 falls in each of the months January and February totalling 4 ft. 10 in. and 2 ft. 9 in. respectively. Snowline descended to 5,800 ft. and 6,150 ft. respectively in the two months. The snowfall is reported to be above normal in January and much below the average in February. All the well known passes viz. Rupan, Guran, Shathal, Charang and Kailas were unpassable during both the months.

III.—THE UNITED PROVINCES

Almora.—The falls during and accumulations at the end of the months, both of which were nearly normal, in the various localities were as shown below.

Locality	January	February
<i>Falls</i>		
Malla Danpur	7	5
Malla Darma	3½	4
Byana Patti	39	24
Limpia	13	14
Masurleg	14	16
Malla Johar	2	..
<i>Accumulations</i>		
Pinderghati	22½	42½
Pinder Peak	175	175
Nanda Khet	27½	55
Sunderdhung Ghati	45	65
Sunderdhung Peak	37½	85
Bankatia	12½	32½
Masurleg	17	16
Lipu	15	14
Limpia	25	24
Nubedhara	25	29
Kantela Ghati	6½	17½
Kantela Hill	3	5
Kafni Ghati	12½	27½
Kafni Hill	5½	22½
Hansaling Dhura	3	..

Hot Weather Period—March to May.

I.—KASHMIR

Skardu.—No snow fell at the station itself during the season. The accumulations were 3 ft. at the end of March on the surrounding passes and 1 foot and ½ ft. respectively at the end of April and May on the neighbouring peaks.

Dras.—It snowed during each of the months at Dras and on the surrounding mountains. At Dras the falls amounted to 2½ ft. and 3 ft. respectively during March and April, but melted away quickly during May. The falls are reported to have been heavier at higher elevations. The accumulations were as follows :—

	March	April	May
Dras	5 ft.	3 ft.	Nil.
Zojilla pass	7 ft.	6 ft.	2 ft.

The falls during and the accumulations at the end of the season were about the average.

Srinagar.—Five light to moderate falls of snow in March and three each in April and May were observed on the surrounding Pir Panjal Range. The depth of each of these falls did not exceed 1½ ft. in March, 1½ inch in April and ½ foot in May. The falls were above normal. Snow accumulations on the Pir Panjal were said to be above normal throughout the season.

Gulmarg.—No reports are available for March and April. In May there were frequent snowfalls quarter to one foot in depth on the Affarwat and Handibal ranges. The accumulations of snow were one to two feet at the end of the period.

Garhwal.—Snow fell on five days in January and on three days in February. The snowline descended to 2,800 ft. in each of the months. The falls were normal in January and below normal in February. The accumulations on the higher passes at the end of January were about 2 ft. to 4½ ft. and at the end of February 1 ft. to 1½ ft.

Muktesar.—There were five falls of snow in January and two in February. The depth of snow was about 1 ft. 3 in. at the end of January and 1 ft. 9 in. at the end of February.

IV.—ASSAM.

Kamrup.—The reports received indicate that snow fell on many peaks of the Kamrup district.

Baliapara Frontier Tract.—There was very little snow fall on the lower and the upper ranges of the Baliapara Frontier Tract. The lower ranges were free of snow throughout the period. On the upper ranges snowfall was scattered and light. The snowfall was reported to be below the average. The depth of snow on the Se La, the Orka La, the Punsum La and the Riso La was between 2 ft. to 3 ft.

Sadiya Frontier Tract.—Snowfall in both the lower and the higher ranges of the Abor and Mishmi hills was less than usual. No other information is available.

Kargil.—Snow fell on two days in March totalling 1·20 inches. There was no snowfall in April and May. The accumulations on the surrounding peaks were 3 ft., 1½ ft., and about 2 ft. in March, April and May respectively. There was no accumulation of snow on the ground.

Sonamarg.—Snow fell on four days in March totalling 2 ft. 7 in. and on two days in May totalling 4 inches. There was no snowfall in April. The accumulations of snow were about 6 ft. on the ground at the end of March. On the Zojilla and Nichaney passes the accumulations were about 8 ft. at the end of March, 5 ft. in April and 3½ ft. by the end of May. The falls and accumulations were about the average.

Leh.—There was one snowstorm in the middle of March, but the snow soon disappeared. During the latter half of April there were several falls of snow but the depth of snow was only about ¾ inch which also soon melted away. A few snowstorms occurred in the 1st half of May but the snow melted immediately. The accumulations of snow on the higher passes were, however, 4 to 5 feet at the end of March, about 5 to 6 feet at the end of April and about 4 to 5 feet at the end of May. Snowline descended to 10,500 ft. in March and to 11,000 ft. in April and May. At the end of May, the highest passes were still closed to traffic.

Muzaffarabad.—The only information received shows that there was no snowfall at Muzaffarabad and that there were accumulations of snow about 3 inches deep on the peaks of the Kagan mountains.

II.—THE EAST PUNJAB.

Chamba.—In March snow fell on two days on the Kalatop range totalling 1 inch and on 4 days on the Pangri range totalling 4 ft. 10 in. The accumulations at the end of the month at an elevation of 8,000 ft. were about two to three feet. No report was received for April. In May snow fell at altitudes above 10,000 ft. The depth of snow on the well known peaks and passes was reported to be greater than normal.

Kangra.—No reports were received for the months of March and April. During May, snowfall occurred on the high ranges of the Himalaya mountains in the Kangra and Palampur Tehsils and in the Kulu sub-division to a depth of about one foot. The snowline did not descend below any high range of the Himalaya mountains. The falls during May were reported to be below normal. The accumulations at the end of May on the high ranges of the Himalayas were about 2 ft. and were below normal. No accumulations existed on the high passes of the Palampur Tehsil and in the Kulu sub-division.

Kilba (Simla District).—Snow fell on eight days in March to a total depth of 4 ft. 5 in. The snowline descended to a height of 6,000 ft. The falls during April and May were confined to higher elevations, the snowline remaining above 8,600 ft. in April and 10,500 ft. in May. All the passes were closed to traffic throughout the period, except Rupin and Buran which were open during May.

South-West Monsoon Period.—June to September 1947—June and July

I.—KASHMIR.

Skardu.—No snowfall occurred at the station proper during June and July nor were there any accumulations. Even on the surrounding passes very little accumulations were reported towards the end of June and by the end of July there were none. The accumulations were below normal.

Dras.—Four light falls of snow to a total depth of one foot occurred on the surrounding mountain ranges during June. In July, it snowed on a couple of occasions at elevations above 11,000 ft. This snow melted away soon. On the well known surrounding peaks, about one foot of snow existed at the end of July.

Srinagar.—Three light falls of snow were observed on the surrounding Pir Panjal mountain range. The depth of each of these falls varied from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. No snowfall was observed in July. The accumulations on the Pir Panjal mountain range were normal.

Gulmarg.—Light falls of snow about half to one inch were observed on the Affarwat and Handibal mountains on four days during the first week of June. During the rest of the period there was no snowfall. At the end of July the snow of the preceding winter was visible on the peaks and gorges of the Affarwat and Handibal mountains to a depth of about 5 in.

III.—THE UNITED PROVINCES.

Almora.—The following table gives the amount of falls during and the accumulations at the end of each of the months.

Locality	March	April	May
<i>Falls</i>			
Malla Danpur	Ft. 2 $\frac{1}{2}$	Ft. 3	Ft. 3 $\frac{1}{2}$
Malla Darma	1 $\frac{1}{2}$	1	$\frac{1}{2}$
Chaudans	6 $\frac{1}{2}$	2	5
Byans	7 $\frac{1}{2}$	3	6 $\frac{1}{2}$
<i>Accumulations</i>			
Pindar Valley	53	43	50
Nandakhet	37	27	30
Sundar Dhunga	43	35	35
Bankatia	19	17	15
Masurleg	12	9	10
Lipu	12	9	9
Lampia	20	15	16
Nubedhura	29	29	21

The falls as well as the accumulations were generally above normal in each of the three months.

Garhwal.—There were three falls of snow in March and two in May. No snow fell in April. The depth of snow varied from 2 ft. to 3 ft. in March and was 2 ft. on higher altitudes in May. About two feet of accumulations existed at the end of the period on the well known passes and peaks.

IV.—ASSAM.

Kamrup.—The report received does not give any definite information.

Baliapara Frontier Tract.—The only information available is that some snow fell on the upper ranges of the Baliapara Frontier Tract during March.

Sadiya Frontier Tract.—No information is available except that snowfall on both the lower and higher ranges of the Abor and the Mishmi was less than usual.

II.—THE EAST PUNJAB.

Chamba.—No report was received.

Kangra.—No snow fell in Dharmasala during the period. In Kulu, some snow fell at elevations above 13,000 ft. The accumulations were less than normal.

Kilba Hills.—There was no snowfall during June and July. The snowline was above 10,800 ft. in June and above 13,800 ft. in July. All the passes were open for traffic.

III.—THE UNITED PROVINCES.

Almora.—The following table gives the aggregate falls during and the accumulations at the end of June and July on the well known passes and peaks. The falls during and the accumulations at the end of the period were above normal.

Locality	June	July
<i>Falls</i>	<i>Ft.</i>	<i>Ft.</i>
Malla Danpur	3½	3
Malla Darma	6	..
Chaudans	5	4½
Byans	11	9
<i>Accumulations</i>		
Pinder Peak .. .. .	..	225
Pinder Valley	55	43
Nanda Khet	37	27
Sundar Dhunga Peak	21	18
Sundar Dhunga Valley	37	30
Bankatia	14	12
Masurleg	7½	7
Lipu	10	..
Limpia	16	13
Nubedhura	15	..
Kantela Hill	13	2
Kantela Valley	23	11
Kafini Hill .. .. .	..	13
Kafini Valley .. .. .	..	23

Garhwal.—Snow fell on higher ranges above 10,000 ft. in early June, and near Badrinath above 10,000 ft. in July. The accumulations on the well-known passes and peaks were negligible. The falls and the accumulations were reported to be below normal.

August and September

I.—KASHMIR

Skardu.—At the station proper there was no snowfall in August nor were there any accumulations even on the surrounding hills. No report was received for the month of September.

Dras.—Some snow fell of the peaks above the snowline and the accumulations were approximately 1 ft. at the end of August. No report was received for September.

Strinagar.—Light to moderate falls of snow about 2 inches in depth were observed on the surrounding mountains on the 30th August. The accumulations at the end of August on the surrounding mountains varied from 1/4 to 1/2 ft. Report for September was not received.

Gulmarg.—Snow fell on the 30th August on the Affarwat mountain range. The depth of the falls varied from 1 in. to 3 inches and was about normal. The accumulations on

the peaks and gorges of the Affarwat and Handibal mountains were 3½ inches to 4½ inches by the end of August. Report for September was not received.

Kargil.—There was no snowfall during August. The accumulations on the well known peaks were about ½ ft. at the end of August. No report was received for September.

Sonamarg.—There was neither snowfall nor any accumulations on the well-known passes of Zojilla and Nichaney.

Leh.—Report for August was not received. A few light falls of snow occurred at the beginning of September. The accumulations at the end of the month were about one foot.

II.—THE EAST PUNJAB.

Chamba.—No report was received.

Kangra.—No snowfall has been reported.

Kilba Hills.—Snowfall was observed at higher elevations during August, the snowline descending down to 15,300 ft. All the passes were open for traffic. The falls were reported to be below the average. During the latter half of September there was unprecedented snowfall, down to elevations as low as 8,100 ft; consequently the passes became temporarily blocked.

III.—THE UNITED PROVINCES.

Almora.—The falls and accumulations of snow in various localities during the two months are given below. The falls were nearly normal and the accumulations above the average.

Locality	August	September
<i>Falls</i>	<i>Ft.</i>	<i>Ft.</i>
Malla Danpur	1½	2
Malla Darma	1	1
Chaudans	11	13½
Byans	13	13
Malla Johar	0	2
<i>Accumulations</i>		
Pinder Peak	23	35
Pinder Valley	53	19
Nandakhet	21	11
Sundar Dhunga Peak	27	8
Sundar Dhunga Valley	37	11
Bankatia .. .. .	..	..
Masurleg	8	13
Lipu	15	9
Lampia	22	17
Nubedhura	15	15
Kafini Peak	9	1
Kafini Valley	13	4
Kotuli Hill .. .. .	..	1
Kotuli Valley .. .. .	..	5

Garhwal.—Snow fell on to occasions in August and three in September, to depths of three inches and to feet respectively on the higher elevations.

The Retreating Monsoon Period—October to December

I.—KASHMIR

Skardu.—No reports were received for October and November. The snow that fell at Skardu during December when melted and measured as water amounted to 37 cents. On the surrounding high peaks the falls during the month amounted to about 4 ft. The falls were below normal at Skardu proper and normal on the surrounding high peaks.

Dras.—Snow fell at Dras and on the well-known peaks of the surrounding mountains during all the three months. The depths of accumulations at the end of each month on the passes and peaks were as follows :—

			Octo- ber	Novem- ber	Decem- ber
			Ft.	Ft.	Ft.
Passes	..	..	1	$\frac{1}{2}$	3
Peaks	..	..	1	1	5

The falls and accumulations were reported to be normal.

Srinagar.—Two light falls of snow one to two inches in depth were observed on the surrounding Pir Panjal mountain range in October. In November there was no snowfall either on the Pir Panjal Range or in the Srinagar valley. In December, there were eight light to moderate falls on the Pir Panjal, of which six occurred also on the valley. The snow of the heaviest fall when melted and measured as water amounted to 2.09 inches. This heavy fall is reported to have caused great damage to trees, telegraph poles, constructions and to lines of traffic in Kashmir. The total fall of snow during December when melted and measured as water amounted to 4.21 inches. The accumulations of snow on the surrounding mountains especially the Pir Panjal range were reported to be normal at the end of October, below normal at the end of November and 8 to 12 ft. in depth at the end of December. The accumulations at the end of the season were above normal.

Gulmarg.—No report has been received.

Kargil.—There was no snowfall during October and November. Snow fell on 6 days in December. The accumulations on the well-known peaks at the end of each of the three months were 6 inches, 6 inches and 5 ft. respectively. On the ground about one foot of snow existed at the end of December. The accumulations were slightly above the average at the end of the season.

Sonamarg.—Snow fell on one day in October to a depth of about 6½ inches. It also snowed on the well-known passes of Zojilla and Nichaney. There was no snowfall during November. It snowed on 6 days in December to a total depth of 3 ft. 10 inches. All the falls also occurred on the Zojilla and Nichaney passes. The accumulations at the end of the months are given below.

	Octo- ber	Novem- ber	Decem- ber
Sonamarg	Nil	Nil	4 ft.
Zojilla and Nichaney passes	6 in.	Nil.	6 ft.

The falls as well as the accumulations were about normal.

Leh.—There was no snowfall at the station proper in October. During the first half of the month, however, several light falls were observed on the high peaks, and the snowline descended to 16,500 ft. There was no snowfall in November. In December there were two light falls which when melted and measured amounted to 8 cents. There was a little snow on the neighbouring passes at the end of October, about 18 inches at the end of November and about 2 ft. at the end of December. The falls and accumulations were slightly below the average.

II.—THE EAST PUNJAB

Chamba.—No report was received for October and November. During December, snow fell on three days to a total depth of 1 ft. 9 inches at Kilar in the Pangri range, and on four days to a total depth of 11 inches at Bhandal in the Bhandal range. Snowline descended to about 5,000 ft. during this month. The accumulations of snow at the end of the month measured 8 inches at Kilar and about 5 ft. on some of the higher passes. The passes were closed to traffic. The falls and the accumulations were below the average.

Kulu (Kangra District).—Snowfall was confined to heights above 6,000 ft. The accumulations at the end of the period on the mountains were about 1 ft. at 8,000 ft. and 2 ft. at 10,000 ft. In places, snow had descended to heights of 6,000 ft.

Kilba (Simla District).—The only information received for the months of November and December shows that during these two months, all the passes remained blocked, the snowline descended to 9,400 ft. and 8,500 ft. respectively and that the snowfall was below normal. During December, it snowed down to elevations of 6,800 ft. but the snow disappeared at the lower levels. The passes continued to remain blocked. The falls were less than the average.

III.—THE UNITED PROVINCES

Almora.—No reports were received for November. The falls during and the accumulations at the end of October and December as estimated by the Patwaries are given below. The falls and accumulations were above the average in October and average in December.

Locality	October	November	December
<i>Falls</i>			
	Ft.	Ft.	Ft.
Malla Danpur	4½	No report received.	4½
Malla Darma	2	Do.	1
Chaudans	9	Do.	13
Byans	15½	Do.	10½
Malla Johar	3	Do.	3
<i>Accumulations</i>			
Pindar Peak	22½	No report received.	55
Pindar Valley	55	Do.	27½
Nandkhet	22½	Do.	20
Sundar Dhunga Peak ..	17½	Do.	..
Sundar Dhunga Valley ..	27½	Do.	22½
Bankatia	17½	Do.	12½
Masurleg	13	Do.	19½
Lipu	15	Do.	19
Lampia	25	Do.	29
Nubedhura .. ..	..	Do.	15
Kaffini Hill	17½	Do.	8
Kaffini Valley	27½	Do.	22½
Kotuli Peak	2½	Do.	4½
Kotuli Valley	12½	Do.	18
Panchachuli .. ..	..	Do.	8½
Hoshling .. ..	..	Do.	2

Garhwal.—There were two falls of snow during October, none during November and seven during December. The depths of the falls at the higher altitudes were about 1½ ft. at the end of October and 10 ft. at the end of December. These were also reported to be the amount of accumulations at the end of the respective months. The accumulations were above the average.

IV.—ASSAM.

Reports regarding snowfall in this region have not been received.

Summary

Cold Weather Period, January and February.—Snowfall during and the accumulations at the end of the cold weather period were generally above the average on the mountain regions to the north and northwest of India and below the average on the Assam hills.

Hot Weather Period, March to May.—The falls and accumulations were nearly normal except on the United Provinces where they were above the average.

Southwest Monsoon Period, June and July.—Snowfall during this period was, as usual, confined to higher elevations and the accumulations at the end of the period were negligible.

Southwest Monsoon Period, August and September.—There were no falls of snow except at isolated localities in Kashmir, the East Punjab and the United Provinces and these were about normal. The accumulations that existed at the end of the period were negligible.

Retreating Monsoon Period, October to December.—The falls as well as the accumulations were about normal in Kashmir and slightly above in the United Provinces. Elsewhere they were below the average.